



# EVALUATION OF GREEN INITIATIVES IN A HEALTH CARE FACILITY IN INDIA

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## ABSTRACT

**Background:** A green and healthy hospital recognizes the connection between human health and the environment and demonstrates understanding through its governance, strategy and operations. When considering a 'Green Hospital' the issues which should be addressed include, energy and water efficiency, use of renewable energy and environmental impact of waste disposal. Green hospitals therefore promote green health care by improving the health of patients, medical staff and the environment. **Objectives:** To assess the green initiatives in the areas of water management and waste management in a health care facility. **Research Methodology:** Data collection was done through an observation checklist to assess the green initiatives in areas of water management and waste management. The observation was made in the areas where such equipment's and facilities were located. Informal interview with the In-charges of various departments such as maintenance, biomedical, housekeeping and related departments was conducted to assess the green initiatives in the selected hospital. **Results:** The study showed that most of the green initiative aspects were taken up by the existing healthcare facility. But there are few areas which need to be focussed such as the capture of rain water system, composting of waste and organizing educational program for employees, that highlights the need to conserve and use scarce resources efficiently.

**KEYWORDS:** Green Hospital, Green Initiatives, Water Management, Waste Management.

## INTRODUCTION

Green hospitals enhance patient wellbeing, aids in curative process while utilizing natural resources in an efficient environment friendly manner. A hospital that has taken the initiative will choose an environmentally friendly site, utilize sustainable and efficient designs, use green building materials and products, energy and water conservation and thinks green during construction, keeps the greening process going. A Green Hospital is constructed around a facility that recycles, reuses materials, reduces waste and produces cleaner air. In the operational stage the hospitals need to consider environmental aspects of waste management to promote the green concepts.

A green and healthy hospital is the one that promotes public health by continuously reducing its environmental impact and ultimately eliminating its contribution to the burden of disease. A green and healthy hospital recognizes the connection between human health and the environment and demonstrates understanding through its governance, strategy and operations. It connects local needs with environmental action and practices primary prevention by actively engaging in efforts to foster community environmental health, health equity and a green economy" (Karlner and Guenther, 2011). Green or sustainable building involves the practice of increasing the efficiency with which buildings and their sites use energy, water, materials and reducing building impacts on human health and the environment, through better site selection, design, construction, operation, maintenance, and removal, through the complete building life cycle" (Howard, 2003).

Green building is "the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle. This practice expands and complements the classical building design concerns of economy, utility, durability, and comfort. Green building is also known as a sustainable or high-performance building" (Bandhauer et al., 2013). Sustainable, green, and high-performance involve an integrated approach to energy conservation and efficiency; indoor environmental and air quality; and the efficient, effective use of site, water, and material resources. Genuine long-term environmental sustainability means more than the mainstream construction of buildings. It entails designing and constructing deep green "restorative" buildings, those that enhance the environment by producing more energy than they consume, and those that provide comfortable indoor environments with healthy Indoor Air Quality (IAQ) (McLennan, 2004).

Researchers studied the different possibilities for providing heating, air conditioning and hot tap water to a Spanish hospital. They considered several cogeneration systems with diesel engines and gas turbines. They observed that the most important parameter is the electricity produced and concluded that the control strategy and the size of the facility have a strong influence on the energy system (Renado, 2006). The most affordable renewable solutions were biogas energy, wood chip heating, and ground source heating. Biogas energy was the most affordable solution although it is only suitable for large-scale projects since the system is not yet commonly used and some risk of uncertainty must be added

(Kantola, 2013). Researchers demonstrated in a hospital in Belgium that it is possible to save up to 71% of the primary energy by using stored thermal energy in combination with a heat pump, instead of conventional gas-based boilers and water chillers (Vanhoudt et al, 2011).

Cleaning to protect health without harming the environment is delineated as Green Cleaning. It is achieved by using processes and materials by ensuring that the cleaning is performed with the interest of all the building residences' well-being and the environmental health. Despite the establishment of Green Hospital in some countries of world, global efforts just address the climate change and protect the environment and the literature has been less paid to the green hospital. Although a lot of researchers have been separately worked on each of the green hospital dimensions including green building; unfortunately, the little research has been conducted about green hospital dimensions comprehensively (Azmal, et al., 2014). Health Care Organizations must implement green initiatives to produce healthier environments for patients, visitors and staff. In addition, the green initiatives will direct the hospital in taking a number of initiatives designed to reuse materials and reduce material waste. Green hospitals promote sustainable building materials, energy and water conservation, waste reduction and recycling, and also environmentally preferable medical waste treatment and disposal.

## RESULTS

The data on green initiatives with regard to water and waste management in the selected healthcare facility is given in tables:

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Sl. No	CATEGORY	ACHIEVABILITY	
		Yes	No
WATER MANAGEMENT INITIATIVES			
1	There is a system in place to monitor water usage throughout the facility	Y	
2	There is a rainwater capture system		N
3	There are efficient faucets in the water distribution system	Y	
4	The facility has an educational program that highlights the need to conserve and use water efficiently		N
5	System of water pipes and drains are regularly checked for leaks	Y	
6.	Pipes and drains incorporate shut-off system	Y	

7	There are safe strategies to recycle waste water for other purpose of the hospital	Y	
8	Collection of storm water run-off		N
9	Water leaks are inspected through water audits to achieve optimal utilization of water		N
12	There is an auto shut-off system for main water tank when the tank is full	Y	

**TABLE 1: Green Initiatives in the Area of Water Management**

Table 1 illustrates the green initiatives with reference to water management in the existing facility. The water consumption is monitored and there are adequate measures for recycling the waste water. But the existing facility also has few drawbacks such as unavailability of rain water harvesting system, collection of storm water run-off and educational program that highlights the need to conserve and use water efficiently.

Sl. No	CATEGORY	ACHIEVABILITY	
		Yes	No
WATER MANAGEMENT INITIATIVES			
1	Health facility reduces waste and emissions through composting		N
2	Health facility cuts waste through recycling of products	Y	
3	Waste is segregated in color coded containers	Y	
4	Different types of waste are disposed in accordance to the Waste Management Rules	Y	
5	There is a central location where waste is collected, transported, labelled and stored	Y	
6	Waste handling personnel wear Personal Protective Equipment (PPE) while handling waste	Y	
7	Monthly and annual statistics is kept for all waste generated	Y	
8	Waste management officer is appointed to oversee the waste handling and disposal process	Y	
9	There is a proper budget allocated for waste management and disposal	Y	
11	Covered vehicles are used for transportation of biomedical waste	Y	

**TABLE 2: Green Initiatives in the Area of Waste Management**

Table 2 illustrates the green initiatives with reference to waste management in the existing facility. Most aspects of the green initiatives in the waste management are practiced in the hospital. Importance has to be given to reduction of waste and emissions through composting.

## DISCUSSION

Water management is crucial in health care organizations, efficient management of such scarce resource contributes to efficiency in service delivery to patients within the hospital setup. The research on green initiatives in the selected facility revealed that the water consumption is monitored and there are measures for recycling. Educational program that highlights the need to conserve and use water efficiently need to be planned. The significance of preserving natural resources, such as water must be taught to users in all kinds of industry (Prabhakar et al., 2021).

Reduction and proper handling of waste is required to safeguard the hospital staff and patients against any infection or hazard. The facility under research was found to practice most of the green initiatives with regard to waste management. Composting could be an effective method to reduce waste and its emission. Composting is an alternative that has been used on a large scale as a tool for sustainability practices, being a form of recycling organic waste that avoids over-

loading waste in landfills. The process generates an organic compost that can be used to fertilize the soil in gardens and vegetable gardens. Composting is a viable and safe procedure to use in hospitals (Santos & Filho, 2021). The composting process helps to protect underground water from becoming polluted compared to the landfilling method of waste disposal, which could pose a pollution threat to underground water. This is because there is a reduction of the microbes and chemical pollutants during composting (Ayilara et al., 2020). Thus, green initiatives with regard to water and waste management have better prospects in protecting the people and environment. Future researchers require to explore newer green initiatives to suggest better environmental safety to the personnel and patients.

## CONCLUSION

Green Initiatives in Healthcare Organizations is a newer concept aiming at the preservation of environment and focusing on green strategies to enhance the positive impacts on patients and staff in the hospitals. An assessment regarding green initiatives was made in the areas of water and waste management. The study showed that most of the green initiative aspects were taken up by the Healthcare Organization. Implementation of the green initiatives by Healthcare Organizations produces healthier environments for patients and staff, not only saves energy, but also money. Green hospital design fosters better patient outcomes and staff retention. Periodic assessment of green initiatives will provide the Healthcare Managers an insight of the new initiatives for making the hospital's environment safe for the patients, staff and visitors.

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